Application Note

Copying CRT Graphics from the HP-83/85 to the 82905B

Hardcopy images of CRT graphics can be generated using the BASIC programs listed below. Binary utility routines also exist for this purpose and are available through the HP Series 80 Users' Library. These utilities will provide a single-command copy capability and will copy much faster than the BASIC routines. Ordering information for these is given at the end of this note.

Program 1—Rotated Copy (3 min.)
Enter the program as shown below and store as "RCOPY"

```
10 ! PROGRAM TO COPY HP-83/85 CRT GRAPHICS TO THE 82905B
20 ! ** ROTATED COPY **
40 PRINTER IS 701, 80
50 G$=CHR$(27)"&b192"'
60 PRINT CHR$(27)"&l9D"
70 PLOTTER IS 1
80 SCALE 0, 255, 0, 191
90 FOR I=0 TO 31
100 MOVE I*B, 191
110 BREAD A$, 1
120 A=POS(A$, CHR$(13))
130 IF A THEN A=A$[A, A]=CHR$(12) @ GOTO 100
140 FOR J=1 TO 192
160 NEXT J
170 SET I/O 7, 16, 0
180 PRINT USING 190; G$, B$
190 IMAGE 23X, 7A, 192A
200 SET I/O 7, 16, 2
210 PRINT USING "K"; "
220 NEXT I
230 PRINT CHR$(27)"&16D"
240 END
```
Program 2—Horizontal Copy (16 min.)
Enter the program as shown below and store as "HCOPY"

```
10 !PROGRAM TO COPY HP-83/85 CRT GRAPHICS TO THE 82905B
20 ! ** HORIZONTAL COPY **
30 DIM A$(256), B$(7)
40 PRINT 701,80 ! SELECT PRINTER
50 G$=CHR$(27) & "&b2566"
60 PRINT CHR$(27) & "19D"
70 SETGU ! SPACING TO 8 DOTS
80 MOVE 0,100 ! SET C RT SCALE TO GRAPHICS UNITS
90 FOR L=1 TO 24
100 BREAD A$,32 ! MOVE TO UPPER LEFT
110 SET I/O 7,16,0 ! READ 8 ROWS OF DOTS FROM CRT
120 PRINT USING 130 ; G$ ! ELIMINATE END-OF-LINE SEQUENCE
130 IMAGE 15X,7A
140 FOR I=1 TO 32 ! CONVERT CHARACTERS TO NUMBERS
150 A0=NUM(A$(I+0*32))
160 A1=NUM(A$(I+1*32))
170 A2=NUM(A$(I+2*32))
180 A3=NUM(A$(I+3*32))
190 A4=NUM(A$(I+4*32))
200 A5=NUM(A$(I+5*32))
210 A6=NUM(A$(I+6*32))
220 A7=NUM(A$(I+7*32))
230 FOR J=7 TO 0 STEP -1
240 ! CONVERT HORIZONTAL BYTES TO VERTICAL
250 Q=2^J
260 G=128*(A0\Q MOD 2)+64*(A1\Q MOD 2)+32*(A2\Q MOD 2)+16*(A3\Q MOD 2)
270 G=G+8*(A4\Q MOD 2)+4*(A5\Q MOD 2)+2*(A6\Q MOD 2)+A7\Q MOD 2
280 ! CHECK FOR CR CHARACTER AND REPLACE
290 IF G=13 THEN G=12
300 PRINT USING "A";CHR$(G) ! SEND OUT DATA
310 NEXT J
320 NEXT I
330 SET I/O 7,16,2
340 PRINT USING "K" ; " "
350 NEXT L
360 SETUU ! RESET CRT TO USER UNITS
370 PRINT CHR$(27) & "&16D" ! SPACING TO 6 LPI
380 END
```

Procedure

1. LOAD and RUN your application program (e.g., Standard Pac "HISTO") which generates the CRT graphics you wish to copy.

2. If you have entered data using the application program, make sure it is saved as the following steps will clear the computer memory.

3. Using the LF (linefeed) button on the printer, position the paper to the point where you wish the top of the graph to start and put the printer ON-LINE.

4. LOAD one of the two programs (RCOPY or HCOPY) and press the RUN key.

5. If you have more work to do with your application program you must re-LOAD it.
Below are examples of both the RCOPY and HCOPY output of the program generated from Problem 12.3 in your HP-85 Owner's Manual. The graphs show $Y = \sin(x)/x$. 

**ROTATED COPY**

![Graph of $Y = \sin(x)/x$ rotated copy]

**HORIZONTAL COPY**

![Graph of $Y = \sin(x)/x$ horizontal copy]
Ordering Information For Binary Utilities

Binary utilities exist to provide a faster screen copy with a single BASIC command similar to the COPY command on the HP-85. This will allow you to include the command in your application program if it does not already use a binary program. The utilities also provide the capability to read the screen in rows of 8 dots at a time to facilitate partial copying or other special needs. These utilities are available from the appropriate Users' Library listed below under the name "PCOPY". Your dealer or sales representative also has ordering information for Users' Library programs.

When ordering, please fill out all the information below. Include a check or money order for the appropriate amount and send to one of the following addresses:

For Europe, the Mideast and Africa (excluding South Africa):

Users' Program Library Europe
Hewlett-Packard S.A.
7, rue du Bois-du-Lan
P.O. Box CH-1217 Meyrin 2
Geneva, Switzerland

For the U.S. and all others:

Series 80 Users' Library
Hewlett-Packard
1010 N.E. Circle Blvd.
Corvallis, Oregon 97330
U.S.A.

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"PCOPY" BINARY UTILITY PROGRAM

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